

## AMENDMENTS TO THE SPECIFICATION

Please replace the first paragraph on page 4, line 1 with the following amended paragraph:

The present invention is directed to a computer implemented method of analyzing a physical signal. The method includes the steps of inputting the signal, extracting a set of Intrinsic Mode Functions from the signal, generating a set of mean frequency functions from the Intrinsic Mode Functions, and generating the instantaneous frequency based on critical points of the signal.

Please delete the second paragraph on page 4, line 9.

Please replace the third paragraph on page 4, line 16 with the following amended paragraph:

Figures 1(a)-(b) are high-level flowcharts describing the overall inventive method of extracting Intrinsic Mode Functions (IMFs) via Empirical Mode Decomposition (EMD) and using Generalized Zero Crossing to obtain the Instantaneous Frequency.

Please replace the first full paragraph on page 8, line 6 with the following amended paragraph:

It is to be noted that various combinations of the critical points and weights can be used to compute the mean frequency.

Please replace the first full paragraph on page 9, line 10 with the following amended paragraph:

Referring to step 350 of Figure 1(a), serious problems of the spline fitting can occur near the ends, where the cubic spline being fitted can have large swings. The end swings, if not fixed, can eventually propagate inward and corrupt the whole data span especially in the low frequency components. For example, if the signal contains a very high amplitude for a short

period time such as the sound signal of a gunshot as shown in Figure 3(a), the method disclosed in the above references may not generate reasonable results due to extreme overshoot in the cubic spline fitting. Referring to Figure 3(c), which deals with a problematic area of the data of Figure 3(a), the upper and lower envelopes 21, 31 are constructed by connecting local maxima and minima with straight lines, respectively. For comparison, Figure 3(b) shows the upper and lower envelopes 21', 31', which are constructed with the cubic spline fitting. As anticipated, the EMD based on the cubic spline fitting does not generate reasonable IMFs as shown in Figure 3(d) whereas IMFs obtained through the straight line fitting gradually converge to a monotonically decreasing signal as shown in Figure 3(e).